

Patent Claims

JC17 Rec'd PCT/PTO 20 JUN 2005

1. Plant cell which is genetically modified, the genetic modification leading to the reduction of the activity of one or more SSIII proteins occurring endogenously in the plant cell and to the reduction of the activity of one or more BEI proteins which occur endogenously in the plant cell and to the reduction of the activity of one or more BEII proteins which occur endogenously in the plant cell in comparison to corresponding plant cells, of wild-type plants, which have not been genetically modified, whereas the genetically modified plant cells synthesize a modified starch, which after gelatinization of a 6% suspension in water forms a gel with a gel strength that is increased by at least 300% in comparison with the gel strength of starch extracted from corresponding plant cells, of wild-type plants, which have not been genetically modified.
2. Plant cell according to Claim 1, wherein the genetic modification is the introduction of one or more foreign nucleic acid molecules whose presence and/or expression leads to the reduction of the activity of one or more SSIII and BEI and BEII proteins occurring in the plant cell in comparison with corresponding plant cells, of wild-type plants, which have not been genetically modified.
3. Plant containing plant cells according to one of Claims 1 or 2.
4. Method for generating a genetically modified plant, in which
 - a) a plant cell which synthesizes a modified starch, which starch after gelatinization of a 6% suspension in water forms a gel with a gel strength that is increased by at least 300% in comparison with the gel strength of starch extracted from corresponding plant cells, of wild-type plants, which have not been genetically modified, comprising the genetic modification of the plant cell, the genetic modification leading to the reduction of the activity of one or more SSIII proteins which occur endogenously in the plant cell and to the reduction of the activity of one or more BEI proteins which occur endogenously in the plant cell and to the reduction of the activity of one or more BEII proteins which occur endogenously in the plant cell, in

- comparison with corresponding plant cells, of wild-type plants, which have not been genetically modified, is generated;
- b) a plant is regenerated from, or using, the plant cell generated in accordance with a); and,
 - c) if appropriate, further plants are generated from the plant generated in accordance with step b).
5. Method for generating a transgenic plant according to Claim 4 which synthesizes a modified starch, in which
- a) a plant cell is genetically modified by the introduction of one or more foreign nucleic acid molecules whose presence and/or expression leads to the reduction of the activity of in each case at least one SSIII, BEI and BEII protein in comparison with corresponding wild-type plant cells which have not been genetically modified;
 - b) a plant is regenerated from, or using, the cell generated in accordance with a); and
 - c) if appropriate, further plants are generated from the plants generated in accordance with step b).
6. Plant according to Claim 3 or obtainable by the method according to one of Claims 4 or 5, which is a starch-storing plant.
7. Plant according to Claim 6, which is a potato plant.
8. Propagation material of plants according to one of Claims 3, 6 or 7, containing at least one plant cell according to one of Claims 1 or 2.
9. Use of one or more nucleic acid molecules which encode proteins with the enzymatic activity of at least one SSIII, at least one BEI and/or at least one BEII protein or their fragments for the generation of plant cells according to one of Claims 1 or 2 or of plants according to one of Claims 3 or 6 to 7.

Amendments to the Claims Under Article 34
(not yet published)

BCS 02-5002-PCT

10. Starch which can be obtained from plant cells according to one of Claims 1 or 2 or from a plant according to one of Claims 3, 6 or 7 or from propagation material according to Claim 8.
11. Starch according to Claim 10, which is a potato starch.
12. Method for producing a starch according to one of Claims 10 or 11, comprising the extraction of the starch from a plant according to one of Claims 3, 6 or 7 and/or from starch-storing parts of such a plant and/or from a plant cell according to one of Claims 1 or 2 and/or from propagation material according to Claim 8.
13. Starch according to one of Claims 10 or 11, obtainable by a method according to Claim 12.
14. Method for modifying the starch of a plant, comprising the method for generating a plant according to one of Claims 3, 6 or 7 and obtaining starch from the plant or starch-containing parts thereof.